Notice of Allowability	Application No.	Applicant(s)	
	10/059,176	HAYASHI, HIROKAZU	
	Examiner	Art Unit	
	Akash Saxena	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *30th October 2006*.

2. ☒ The allowed claim(s) is/are *8 and 9*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 20061114.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

FRED FERRIS
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100

DETAILED ACTION

1. Amended independent claims 8 & 9 are currently pending in this application based on applicant's disclosure filed 30th October 2006.
2. Applicants have cancelled claims 1-7.
3. Claims 8 & 9 have now been allowed over the prior art of record.
4. Examiner acknowledges receipt of a certified copy of Japanese Priority application No. 2001-246268 under 35 USC 119 is complete.
5. Examiner withdraws rejection made under 35 USC § 112 1-7 in view of their cancellation. There were no pending rejection for claim 1 therefore consolidated claims 1 & 8 (as amended claim 8) and claims 1 & 9 (as amended claim 9) also do not have any pending rejections under this statute.
6. Examiner withdraws rejection made under 35 USC § 102 & 103 for claims 1-7 in view of their cancellation.
7. An Examiner's Amendment is attached to this office action, which was done in consent with applicant, based on a phone interview and fax from applicant on 20th November 2006. A clean version is presented below. The fax received, having the annotated version is also attached for record.

Examiner's Amendment

8. **Presented below are clean unmarked versions of the paragraphs that are amended in the specification.**

9. Please replace the paragraph beginning on *page 2, line 4* with the following amended paragraph:

FIGS. 10A-10C respectively show a relation between a distance of a channel direction Distance, and an impurity density Conc. in a case in which a gate length is set to 2.03 μm, 0.52 μm, and 0.21 μm. In the drawing, a portion having a low impurity density corresponds to a channel, and a rise of the impurity density by impurity pileup is seen in portions corresponding to the drain and source on opposite sides of the channel.

10. Please replace the paragraph beginning on *page 9, line 22* with the following amended paragraph:

FIG. 10A-10C show characteristic curves of a relation between a channel longitudinal direction distance and an impurity density for different respective gate lengths.

11. **Please replace Drawings starting from Fig.9 to Fig.14 (Drawings pages 5-9, attached as part of the fax with this office action), which indicates Fig.9 to Fig.14 are PRIOR ART.**

Reasons for Allowance

12. Claims 1,6 and 9 have now been allowed over the prior art of record.

The following is an examiner's statement of reasons for allowance:

Regarding Claim 8-9

Amended claims 8-9 are now allowed as they present limitations not taught by either KU '717 or LI 1999. KU does not teach the limitation of providing the exact impurity functions for based on r1 and r2 as featured in claim 8.

The distinguishing feature from LI'1999 is that LI'1999 discloses a positive exponential relation between the impurity (Np(Y)) with respect to characteristic length. Although characteristic length may be understood as lamda in featured claim, the *exponential relation in LI'1999 is squared* (unlike current claim) and *decay is positive* (unlike negative exponential decay in current claim).

The functions r1 and r2 as exactly defined are found to be novel over prior art. The distances y and Leff are in the same direction and the r1 and r2 expressions are not multiplied by each other to yield the mass of impurity (Claim 9) by either KU '717 or LI 1999 combined.

U.S. Patent No. 6,581,028 by inventor (Hayashi) & same assignee, discloses similar exponential expressions for r1 and r2 (Fig.6), but the definitions of the terms x & y in the patent corresponding to r1 and r2 in instant application are different. X (distance from gate end in the direction of the channel length), y (distance from channel interface in the direction of channel depth) are different from r1 (distance from pileup

position) and r2 (distance from source or drain). Also the terms are not multiplied together to obtain the mass of said impurity moving.

Effectively, if the independent claims of the current application are presented in the similar manner as Patent No. 6581028, expressly claiming the present invention in the equation format (Specification: Pg. 12Eq: 2), the claim may be allowable over prior art of record used.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled **"Comments on Statement of Reasons for Allowance."**

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akash Saxena whose telephone number is (571) 272-8351. The examiner can normally be reached on 9:30 - 6:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini S. Shah can be reached on (571)272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Akash Saxena
Patent Examiner, GAU 2128
(571) 272-8351
Tuesday, November 21, 2006

FRED FERRIS
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100

Fred Ferris
Primary Examiner, GAU 2128
Structural Design, Modeling, Simulation and Emulation
(571) 272-3778

VOLENTINE FRANCOS & WHITT, P.L.L.C.
One Freedom Square
11951 Freedom Drive, Suite 1260
Reston, VA 20190 U.S.A.
Tel: 1.571.283.0720
Fax: 1.571.283.0740
Email: jplaw@volentine.com

FACSIMILE TRANSMITTAL

Date: November 20, 2006

To: Examiner Akash Saxena
U.S. Patent Office
Group Art Unit 2128

Fax No: 571.273.8351

Ph. No: 571.272.8351

From: Andrew J. Telesz, Jr.

Subject: U.S. Serial No. 10/059,176
Our Ref. No.: OKI.298

No. of Pages (including cover): 7

Comments:

Examiner Saxena,
Enclosed are five (5) drawing Replacement Sheets, wherein Figs. 9-14 have been denoted as "Prior Art", and Fig. 10 has been renumbered separately as Figs. 10A-10C, as requested. Also enclosed is a Proposed Examiner's Amendment, to make the specification consistent with the correction to Fig. 10. If you need any further assistance, please let me know.

Andrew J. Telesz, Jr.

OKI.298

Proposed Examiner's Amendment

Please replace the paragraph beginning on page 2, line 4, with the following amended paragraph:

FIGS. 10A-10C respectively show ~~FIG. 10 shows~~ a relation between a distance of a channel direction Distance, and an impurity density Conc. in a case in which a gate length is set to 2.03 μm, 0.52 μm, and 0.21 μm. In the drawing, a portion having a low impurity density corresponds to a channel, and a rise of the impurity density by impurity pileup is seen in portions corresponding to the drain and source on opposite sides of the channel.

Please replace the paragraph beginning on page 9, line 22, with the following amended paragraph:

FIGS. 10A-10C show ~~FIG. 10 shows a~~ characteristic ~~curve~~ curves of a relation between a channel longitudinal direction distance and an impurity density for different respective gate lengths.

Fig.8

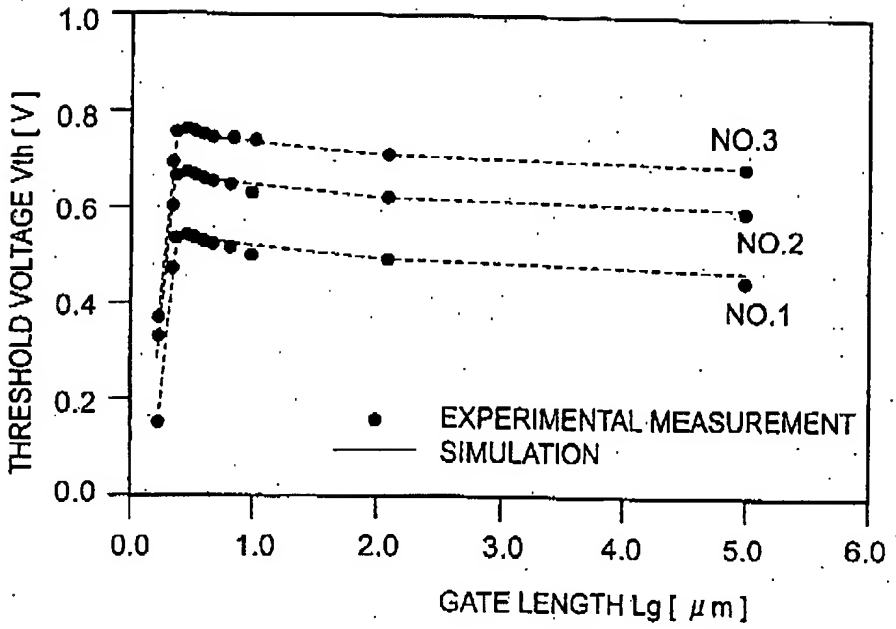

Fig.9

PRIOR ART

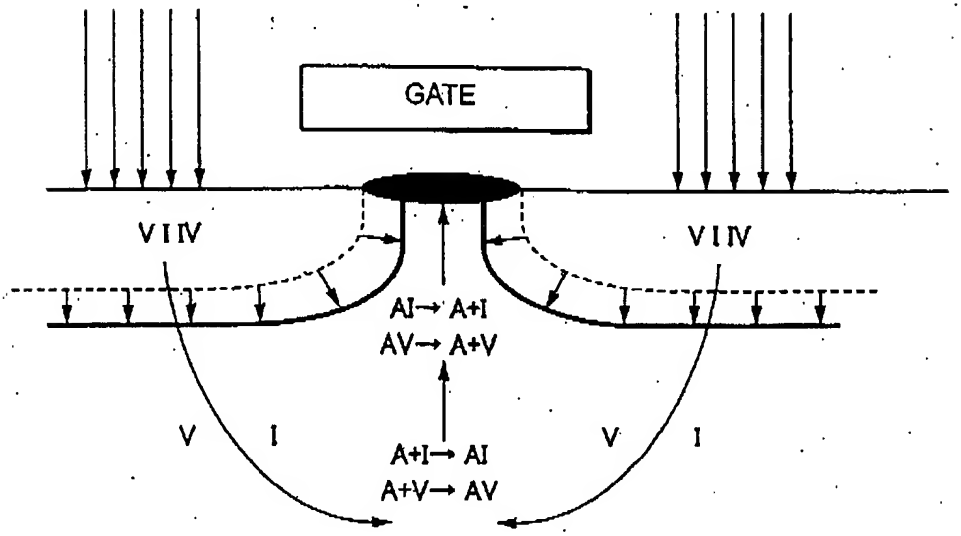

Fig. 10A
PRIOR ART

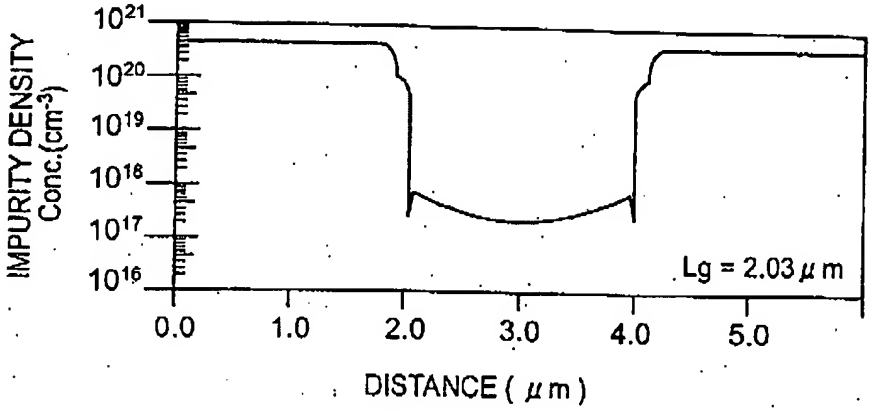

Fig. 10B
PRIOR ART

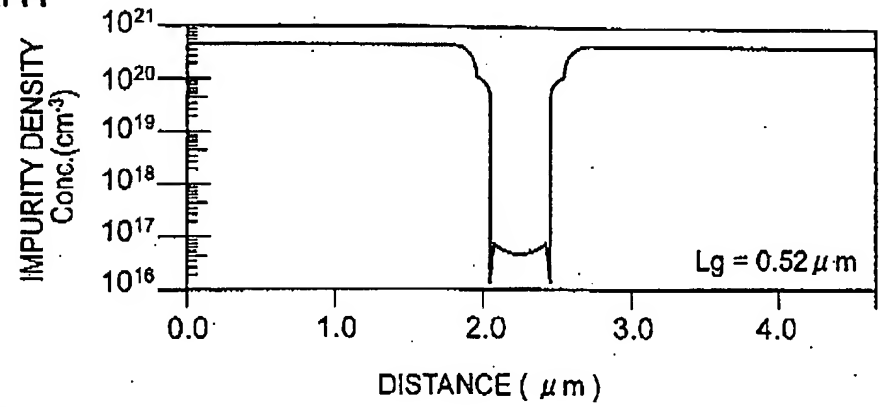

Fig. 10C
PRIOR ART

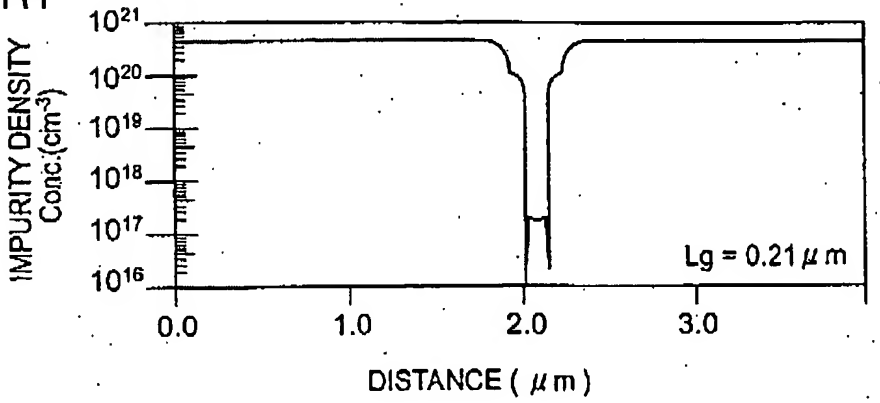

Fig.11

PRIOR ART

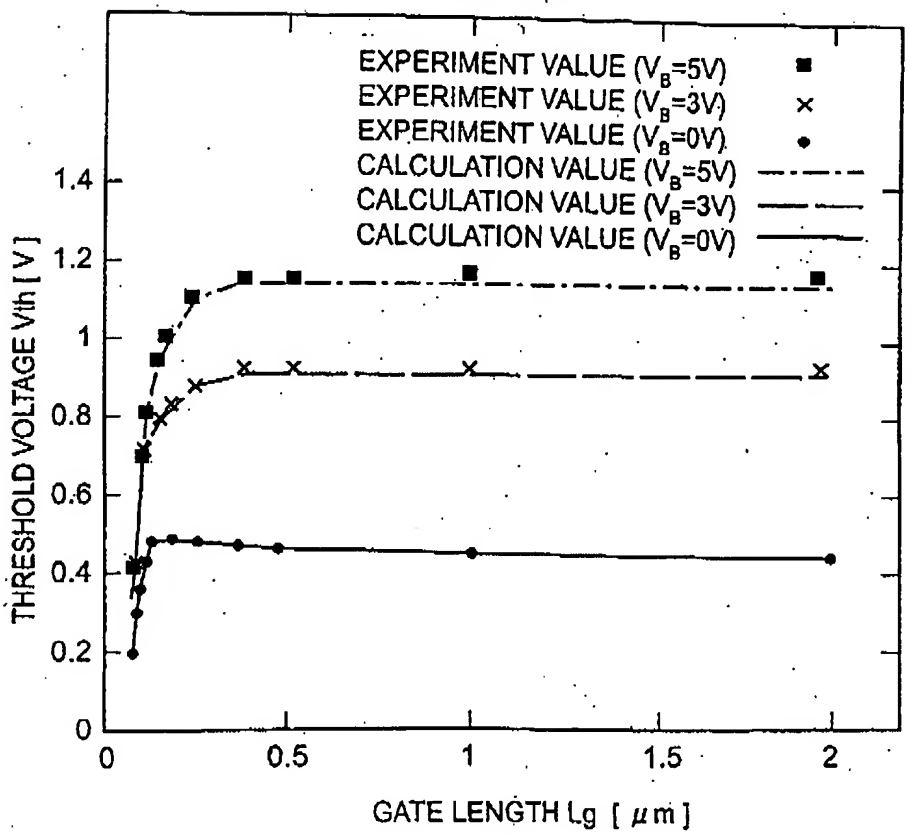

Fig.12
PRIOR ART

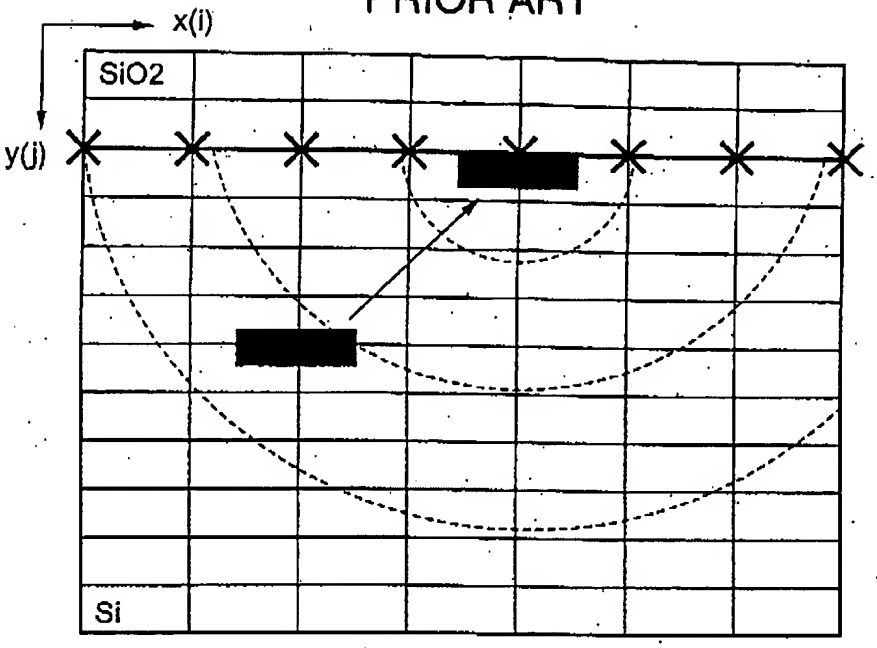

Fig.13
PRIOR ART

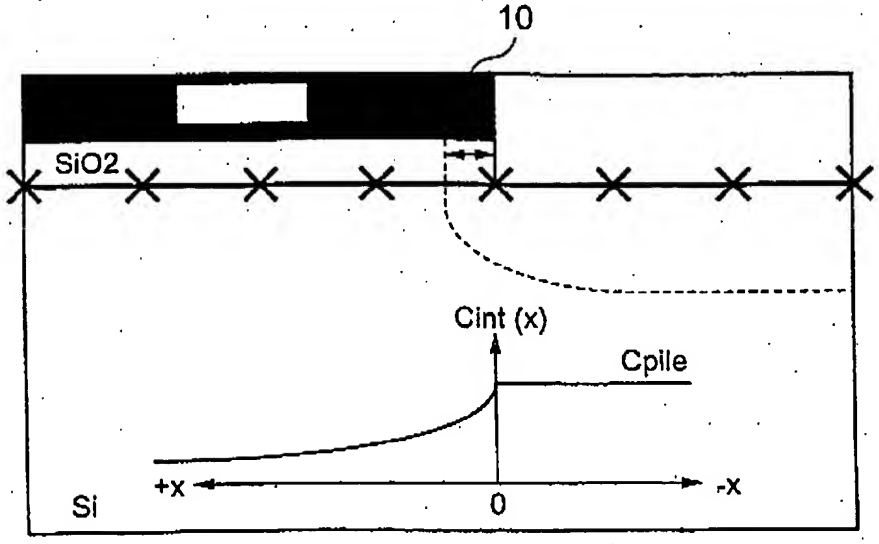

Fig.14
PRIOR ART